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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM:

SUBJECT: Biodegradation Data on Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC) and Didecyl Dimethyl Ammonium Chloride (DDAC) for the Agency's File Record

TO: Velma Noble, Product Manager, Team 31
Regulatory Management Branch I
Antimicrobials Division (7510C)

FROM: Srinivas Gowda, Microbiologist/Chemist Srinivas Gowda 4/1/03
Risk Assessment and Science Support Branch (RASSB)
Antimicrobials Division (7510C)

THRU: Jonathan Chen, Acting Team Leader, Team One Jonathan Chen 4/1/03
Risk Assessment and Science Support Branch (RASSB)
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Norm Cook, Chief Norm P. Cook 04/01/03
Risk Assessment and Science Support Branch (RASSB)
Antimicrobials Division (7510C)

DP Barcode: D288018
Case: 007280
Submission: S628472
Case Type: Resubmission
Common Names: DDAC, Bardac 22 (2250, 2280)
ADBAC, Bardac 205M
Chemical Name: Didecyl Dimehyl Ammonium Chloride
Alkyl Dimethyl Benzyl Ammonium Chloride

EPA Reg. No.: None
MRID No.: 458382-01
Data Submitter: Lonza Inc.
PC Code: 069149 (DDAC) & 069105 (ADBAC)
CAS#: 7173-51-5 (DDAC) & 68424-85-1 (ADBAC)

INTRODUCTION:

As a follow-up to previous discussions with the Agency regarding the dissipation of the "quat" active ingredient in Bardac 22C50, Lonza Inc. has submitted the following documents under the MRID Number 458382-01 which summarizes the biodegradation data on the ADBAC and DDAC to place it in the Agency's file record for future use.

1. Organization for Economic Cooperation and Development: OECD Guidelines for Testing, 1981, Section 3: Degradation and Accumulation, Paris, France.

2. Ruiz-Cruz, J., M.C. Dobarganes Garcia, 1979. XV Relation between structure and biodegradation of cationoc surfactants in river water. Grasas Aceites39, pp 67-74.

3. Ruitz-Cruz, J. 1979. XVI Influence of surfactant concentrations and bacterial acclimation on biodegradation of cationic surfactants in river water. Grasas Aceites, 30 pp 293-299.

4. Gawel, L.J., T.L. Huddleston, 1972. Biodegradability of low concentrations of certain quaternary ammonium antimicrobials by bacteria. Presented at Am. Oil Chem. Soc. Los Angeles. JAOCS, 49(2).

5. Masuda, F., S. Machida, M. Kanno, 1978. Studies on the biodegradability of some cationic surfactants. Proceedings 7th International Congress Surfactant Agents, pp 129-138.

6. Pitter, P., J. Hollerova, J. Simanover, 1978. Biodegradability of Cationic Surfactants: Procedings 7th International Congress Sufactants Agents, pp 82-92.

7. Gerike, P., W.K. Fischer, W. Jasiak, 1978. Surfactant Quaternary Ammonium salts in Aerobic Sewage Digestion. Water Res. 12, pp 1117-1122

8. Larson, R.J., 1983. Comparison of biodegradation rates in laboratory screening studies with rates in natural waters. Residue Rev., 85, pp 159-171.

9. Gilbert, P.A., C.M. Lee, 1980. Biodegradation tests use and value. In: Biotransformation and Fate of Chemicals in the Aquatic Environment. Eds. A.W.maki, K.L. Dickson, J. Cairns. Am. Soc. Micribiol. Washington, D.C. pp 34-45.

10. Birch, R.R., 1982. The biodegradability of alcohol ethoxylates. XIII Jornadas Com. Espanol Deterg. Pp 33-48.

11. Sayama, N., 1981. Studies on microbiological treatment of wastewater from medical schools and hospitals. III Biodegradation of benzalkonium chloride and chlorhexidine. Nippon Eiseigaker Zasshi 35, pp 869-873.

12. Pitter, P., J. Svitalkova, 1961. Biodegradation of cationic agents in laboratory models of activated sludge tanks. 5b VSChT, 5(2), pp 25-42.

13. Baleux, B., P. Caumette, 1977. Biodegradation of some cationic surfactants. Water Res., 11, pp 833-841.

14. Swisher, R.D., 1987. Sufactant Biodegradation. 2nd Ed. Marcel Dekke, Inc. NY, NY. Pp 1085.

15. Boethling, R.S. 1984. Environmental Fate and Toxicity in Wastewater Treatment of Quaternary Ammonium Surfactants. Water Resources 19(9) pp 1061-1076.

16. Gerike, P. 1982. On the biodegradation and bioelimination of cationic detergents. Tenside Deterg., 19, 162-164.

17. Topping, B.W., J. Waters, 1982. Monitoring of cationic surfactants, in sewage treatment plants. Tenside Deterg., 19, 164-169.

18. May, A., A Neufart, 1976. The ecological behavior of cationic surfactants. III. The behavior of distearyl-demethyl ammoium chloride in activated sludge plants, Tenside Deterg., 13, 65-69.

19. Janicke W., G. Hilge, 1979. Biodegradability of anionic/cationic surfactant complexes under aerobic and anaerobic conditions in wastewater and sludge treatment. Tensid Deterg., 16, 117-122.

20. Symposium: Cationic Surfactants and Environment. Tenside Detergents 19 (1983) 3.

21. Aerobic Aquatic Metabolism of Alkyl Dimethyl Benzyl Ammonium Chloride, 1988. ABC Labs. Columbia, Missouri. Study #35715.

22. Anaerobic Aquatic Metabolism of Alkyl Dimethyl Benzyl Ammoium Chloride, 1989. ABC Labs. Columbia, Missouri. Study #35714.

23. Pramer D., R. Bartha, 1972. Preparation and processing of soil samples for biodegradation studies. Environmental Letters. 2(4) pp 217-224.

24. Gerike, P., W.K. Fischer, 1979. A correlation study of biodgradability determinations with various chemicals in various tests. Ecotoxic. Envir. Saf. 3, pp 159-173.

25. Anaerobic Aquatic Metabolism of ^{14}C-Didecyldimethyl Ammoium Chloride, 1991. ABC Labs. Columbia, Missouri, Study #37007.

26. Aerobic Aquatic Metabolism of ^{14}C-Didecyldimethyl Ammoium Chloride, 1991. ABC Labs. Columbia, Missouri, Study #37008.

27. Mackrell, J.A., J.R. L. Walker, 1978. The biodegradation of quaternary ammonium compounds. Int. Biodterioration bulletin, 14, pp 77-83.

28. Lewis, M.A. and Wee, T,, 1983. Aquatic Safety Assessment for Cationic Surfactants. Environmental Toxicology Chem. 2, 105-118.

29. Estimating the Hazard of Chemical Substances to Aquatic Life, 1978. Eds. J. Cairns, Jr., K.L. Dickson, A.W. Maki, ASTM STP 657, pp278.

30. Analyzing the Hazard Evaluation Process, 1979. Eds. K.L. Dickson, A.W. Maki, Jr. Water Quality Section, Am. Fish. Soc., Washington, D.C., pp 159.

RASSB's CONCLUSIONS AND RECOMMENDATIONS:

The submitted thirty documents under the MRID Number 458382-01 which summarizes the biodegradation data on the Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC) and Didecyl Dimethyl Ammonium Chloride (DDAC) was not reviewed or accepted and will be placed in the Agency's file record for future use.

cc: Srinivas Gowda/RASSB/AD

Chemical File (069105/069149)/AD

Reviewed by: Srinivas Gowda, Microbiologist/Chemist, Team 1 Srinivas Gowda Date 4/1/03

DATA EVALUATION RECORD

STUDY TYPE:	Biodegradability of Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC) and Didecyl dimethyl ammonium chloride (DDAC)
DP BARCODE:	D288018
PC CODE:	069105 & 069149
SUBMISSION CODE:	S628472
CASE TYPE:	Resubmission
TEST MATERIAL:	Alkyl Dimethyl Benzyl Ammonium Chloride (ADBAC) Didecyl Dimethyl Ammonium Chloride (DDAC)
SYNONYMS:	ADBAC Bardac 205M DDAC, Bardac 22 (2250, 2280)
CITATION:	"Assessment of the Biodegradability of ADBAC and DDAC" by Christopher Lee, Ph.D., Roy F. Weston, Inc., One Weston Way, West Chester, Pennsylvania 19380, dated June 1992 (MRID No. 458382-01).
SPONSOR:	Lonza Inc.